Enhancing Direct Assessment and Inspection with Remote Inspection Through Coatings and Buried Regions of Non-Piggable Pipelines

Second Quarterly Report
July 1 – September 30, 2006

EMAT Through Coating Inspection Qualified by the DOT at BP Prudhoe Bay, Alaska

In mid August one of Sonic Sensors' EMAT Service Provider affiliates, Kakivik Asset Management, in Anchorage Alaska, was summoned by BP in Prudhoe Bay to help inspect an emergency shut down pipeline. Sonic Sensors immediately dispatched the appropriate EMAT Inspection system to be applied on the problem pipeline. Many inspection tools and techniques were evaluated on these BP lines both with coating and with out coatings. Through all the extensive qualifications the Sonic Sensors EMAT guided wave tool, CIRC, was selected as the **Primary Screening Tool for Non-Piggable Lines.** The techniques used to inspect through the coatings were directly related to this current DOT sponsored project. The EMAT CIRC technique also proved to be the fastest and most reliable technique for screening large volumes of bare pipe or coated pipe. As of October 10th the EMAT crews using exclusively Sonic Sensors equipment, have scanned over 8000 feet on each of the WOA and the EOA oil transit lines in BP's Prudhoe Bay facility. Some of these lines were coated with 6 inch wide polykin tape over mastic adhesive with a 1 inch overlap. This overlap made a 3 mm thick coating the EMAT tool had to ignore, which repeated every 5 inches. The signals resulting from this repeating overlapped tape were shown in the attached report "EMAT trial 08-06JMGversion1.pdf". This report was created by and submitted to the DOT during qualification of the EMAT inspection tool at BP Prudhoe Bay facility in August 2006.

The overlapping tape created a significant challenge to this inspection because it caused a variable lift-off and made significant periodic amplitude variations in the data. Despite this difficulty pitting and corrosion indications could still be detected to satisfactory levels. This situation exemplifies the need for the large lift-off inspection tool to be developed with relative independence to variations in lift-off, and perhaps independent to amplitude as an inspection variable. It is hoped that the algorithm developed in this study will provide adequate information to base the inspection on, and the amplitude information could be ignored. If this is the case the inspection could be *independent* of amplitude and immune to variable lift-off or bumpy irregular surfaces and would be a great practical advantage for this inspection. The results to date demonstrate an amplitude independent analysis is possible. Detecting wall thinning in small patches has been demonstrated this quarter by measuring variables other than amplitude.